TRUE ON LINE UPS

1KVA-10KVA

User's Manual

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Please strictly obey all the instructions in this manual and pay attention to all the warning and operation information. It is not advisable to install or operate the machine before read this manual.

1. Safety Instructions

- The power outlet voltage may still have 220V even not connect to the mains power.
- For the battery cable or power cord replacement, please contact our service station or dealer to purchase, in order to avoid fire caused by inadequate capacity or heat ignition.
- Do not place the battery or battery pack in the fire, that will injure due to explosion.
- Please do not open the UPS case as you will, there is risk of electric shock
- Do not touch the battery connection terminals. Battery loop and input voltage loop is without isolation, which may cause high voltage risk between the battery terminal and ground.
- Should not connect the equipment like hair dryer or electric heater, to ensure the safety for the UPS

Attention:
UPS has high voltage inside, for the personal safety; please do not repair by yourself. If any questions, please contact local service center or dealer.

2. Installation instructions

2.1. Unpacking inspection

- Open the UPS package, please check the enclosed accessories including a user manual, communication cable, CD-ROM. The long-back model is also including the cable for connection to battery bank.
- Check the UPS if any damage in transport. If found damaged or parts missing, do not power on, please turn to the carrier and dealer.
- To determine whether this UPS is the model you want to buy. Check the model name showed both on the front panel and rear panel of UPS to confirm.

Model	Type	Model	Type
1KVAS	1KVA Standard model	1KVAH	1KVA Long backup model
2KVAS	2KVA Standard model	2KVAH	2KVA Long backup model
3KVAS	3KVA Standard model	3KVAH	3KVA Long backup model
6KVAS	6KVA Standard model	6KVAH	6KVA Long backup model
10KVAS	10KVA Standard model	10KVAH	10KVA Long backup model
1KVARS	1KVA Rack Standard model	1KVARH	1KVA Rack Long backup model
2KVARS	2KVA Rack Standard model	2KVARH	2KVA Rack Long backup model
3KVARS	3KVA Rack Standard model	3KVARH	3KVA Rack Long backup model

Note:
Please save the packaging box and packaging materials for future transport use. As heavy product, please transit the UPS with care.

2.2. Attention items of installation

- The UPS location circumstance must be with good ventilation, away from water, flammable gases and corrosive entities.
- Do not lie down the UPS against the wall so that front and side panel air intake hole, rear panel air outtake hole unobstructed.

- The peripheral environment temperature around the UPS should be within 0 ℃ ~ 40 ℃.
- If dismantling the machine at low temperatures, there may be condensation droplets, users can not install or operate it before completely getting dry both inside and outside, otherwise there will be danger of electric shock.
- Place the UPS near the mains socket to cut off AC mains without any delay at any emergent case.

Attention:
- Make sure the load after the UPS is off when user start wiring the load to UPS, then turn on them one by one later.
- Please connect the UPS with the socket which is over-current protected.
- All the power socket should be configured with earthling devise for safety.
- UPS could be electrified or powered whether the input power cable is tied on or not, even when the UPS is off. The only way to cut off the output is switching off the UPS and disconnecting the mains power supply first and second.
- For all standard type UPS, it is advised to charge the battery over 8 hours before virginally used. Once the AC mains power energizes the UPS, it will auto-start the charging work. If without prior charging, UPS output remains as usual but with shorter back up time than normal.
- When connect motor, display equipment, laser printer etc, UPS power selection should be based on the startup power of the load which is usually twice as rated power.

2.3 UPS rear panel view.

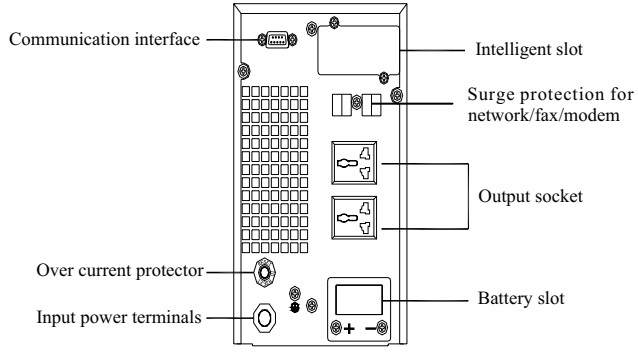


Figure 1. 1kva rear panel

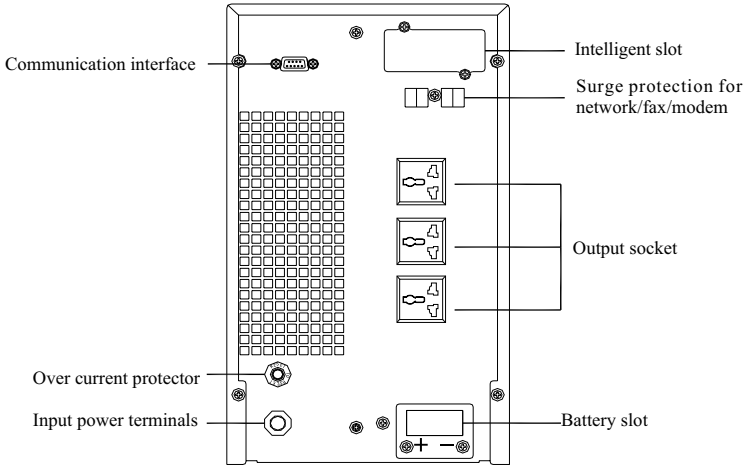


Figure. 2 2kva & 3kva rear panel

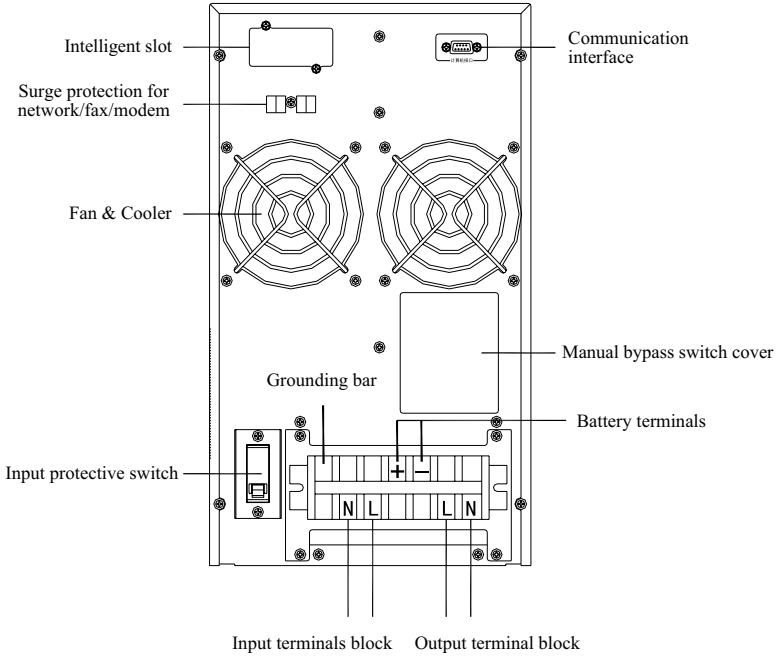


Figure.3 6kva & 10kva long back up type rear view

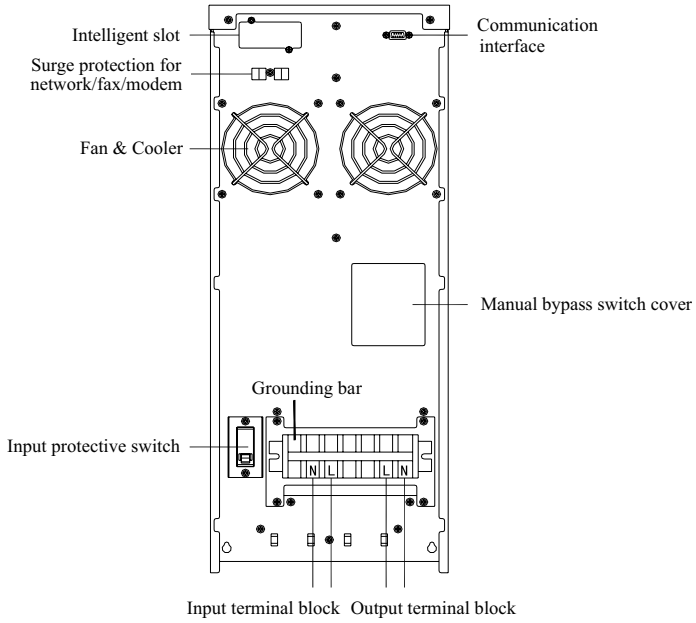


Figure.4 6kva & 10kva standard type rear view

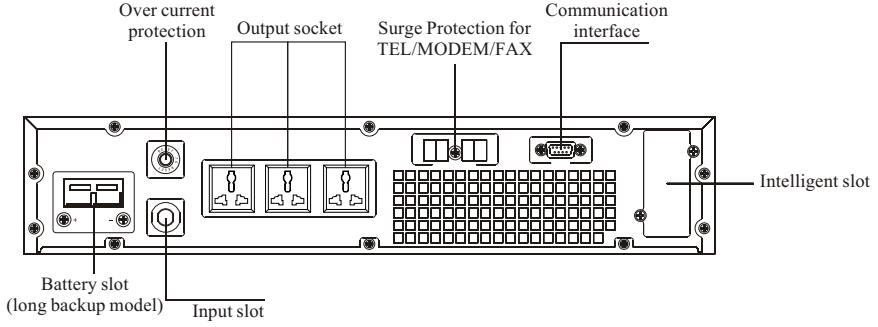


Figure.5 1kva rack standard type rear view

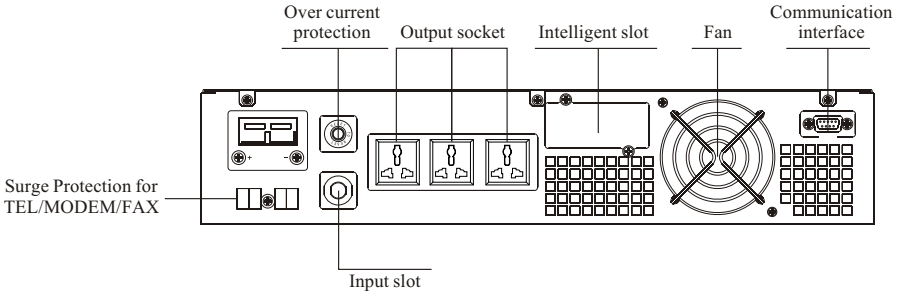


Figure.6 2kva & 3kva rack standard type rear view

2.4 UPS output connection

Type	Connectors (The socket type is selectable)
1KVA	Socket (2)
2KVA	Socket (3)
3KVA	Socket (3)
6KVA	Terminal block
10KVA	Terminal block

Output connection of 1~3kva type is configured with sockets，end user can plug the load cable on the UPS socket to energize the load as the following picture.

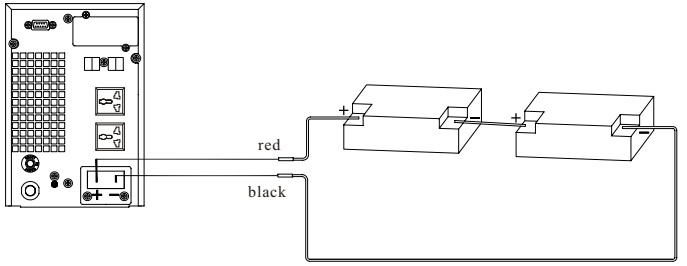
2.5 External battery connection procedure for long back up type.

- As per different UPS type, end user are instructed to configure different battery voltage as below sheet. More or less units are forbidden or else something abnormal or faulty will appear.

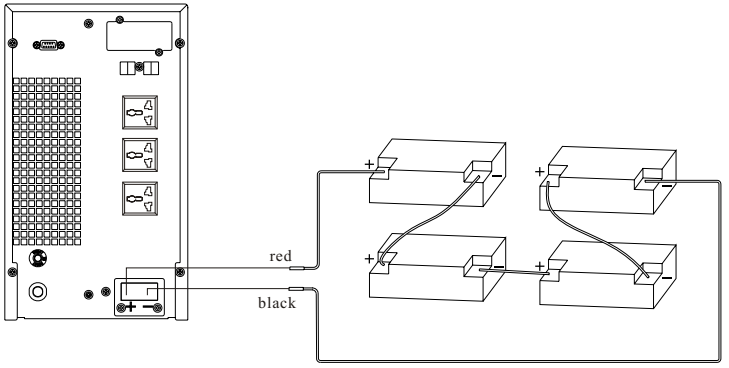
Type	Battery Quantity (unit)	Battery Voltage (volt)
1KVA	2	24
2KVA	4	48
3KVA	6	72
6KVA	14	168
10KVA	14	168

- One end of battery cable is for UPS terminals while the other end with triple cables is for battery terminals. Correct installation procedure is highly vital or else probable electric shock will arise. Users are strictly required to follow the below procedure.
- Connect battery in correct way and make sure the total battery voltage is available for UPS.
- Correctly connect the long battery cable to battery terminals first, red wire is to positive plate while black is to negative. If users connect the UPS first, electric shock or other danger could not be avoided.
- Before connect load after UPS, users should supply main power to UPS and energize it.
- Connect long battery cable to UPS terminals with correct poles link (red is for “+”,black is for “-”), UPS will auto start the charging work.

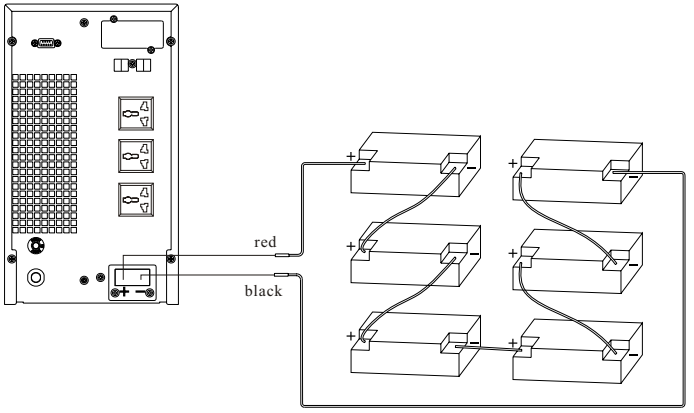
The connection view is like below figures:



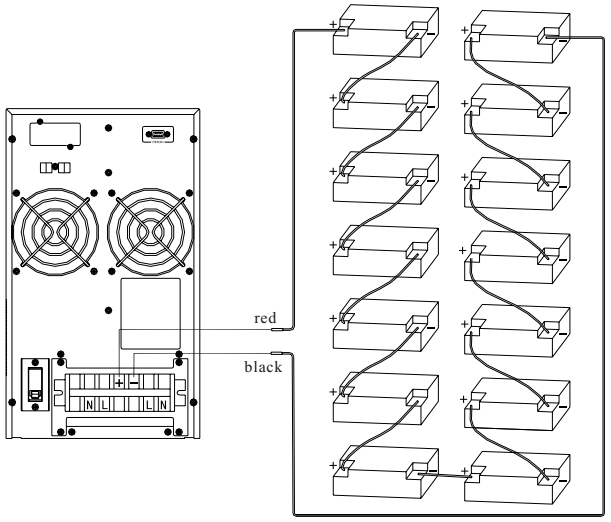
1kva long back up connection



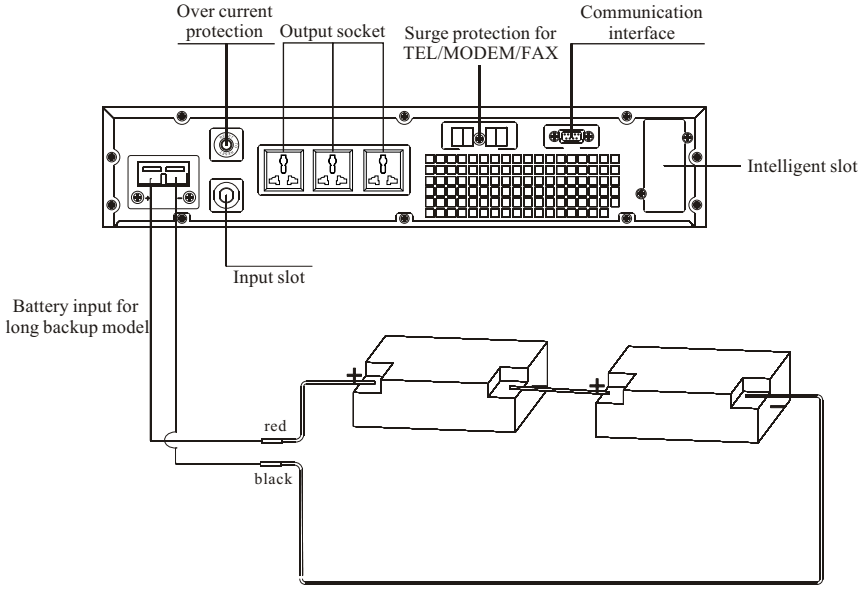
2kva long back up connection



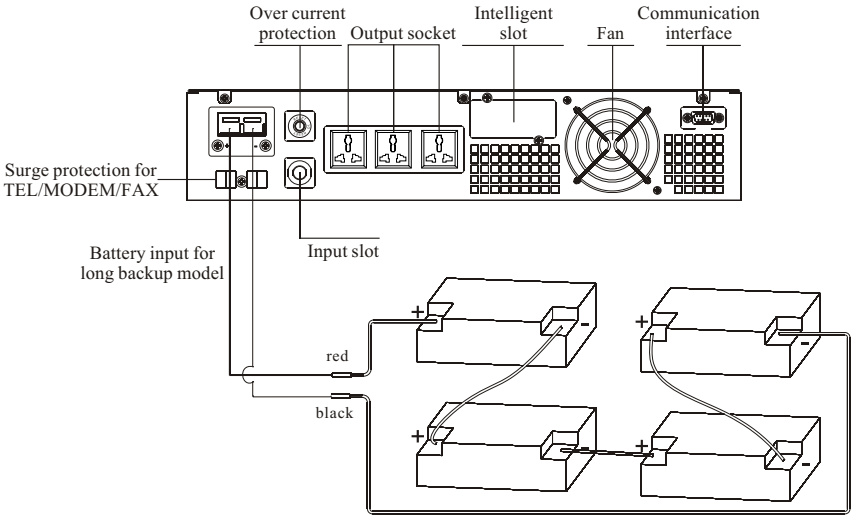
3kva long back up connection



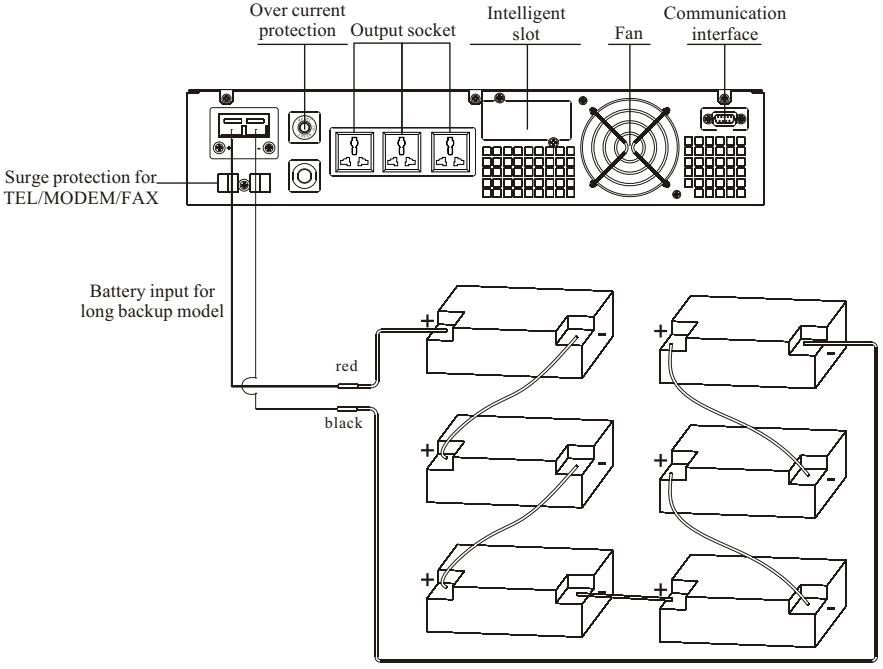
6 &10kva long back up connection



1kva rack long back up connection



2kva rack long back up connection



3kva rack long back up connection

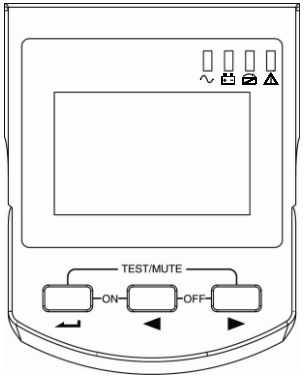
2.6 Installation

- UPS installation work should comply with local electrical standard and only can be done by professional technician. 1KVA~3KVA units could use wall socket as input power connection.
- For all type UPS, it is advised to charge the battery over 8 hours before virginally used. Once the AC mains power energizes the UPS, it wills auto-start the charging work. If without prior charging, UPS output remains as usual but with shorter back up time than normal.

3. Panel function and operation

The operation is simple, operators only need to read the manual and follow the operation instru ctions listed in this manual without any special training.

3.1 Keys function



※ ON key （↵ + ◄）

Press and hold this key for more than half a second to turn on the UPS.

※ OFF key （◄ + ►）

Press and hold this key for more than half a second to turn off the UPS.

※ TEST/MUTE key （↵ + ►）

Press and hold the key for more than 1 second in mains mode or economical mode: UPS runs the self-test function.

Press and hold the key for more than 1 second in battery mode: UPS runs the mute function.

※ INQUIRING key （◄ , ►）

Non-function setting mode:

Press and hold ◄ or ► for more than half a second (less than 2 seconds): display the items orderly.

Press and hold ► for more than 2 seconds: Circularly and orderly display the items every 2 seconds, when press and hold the key for some time again, it will turn to output status.

Function setting mode:

Press and hold the key for more than half a second (less than 2 seconds): Select the set option.

※ Function setting key ↵

Non-function setting mode:

Press and hold the key for more than 2 seconds: Function setting interface.

Function setting mode:

Press and hold the key for more than half a second (less than 2 seconds): Affirm the set option.

Press and hold the key for more than 2 seconds, exit from this function setting interface.

3.2 LED Function

From left to right is Inverter LED, Battery LED, Bypass LED and warning LED.

Warning red LED is on: UPS is fault. For example: Overload beyond the allowed time, inverter fault, BUS fault, over temperature fault etc.

Bypass yellow LED is on: UPS is alarming. For example: Bypass mode supply power and etc.

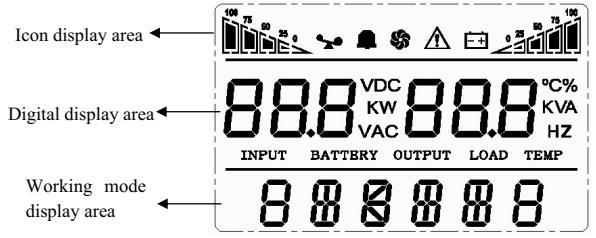
Battery yellow LED is on: UPS is alarming. For example: Battery mode supply power and etc.

Inverter green LED is on: UPS is normally powered by mains or ECO mode or battery mode.

PS: LED display detail in different mode is listed in 5 items.

3.3 LCD display function

LCD displays as following Figure.



※ Icon display area:

i. The top diagram is for load and battery capacity indication, each grid of which represents 25%. When UPS is over loaded, the load light will blink as same as the battery light blink when the capacity of battery get low or battery disconnected.

ii. The fan icon is for fan working indication; when fan normally runs, the icon will display rotation; if the fan is not connecting or faulty, the icon blinks;

iii. Press the mute button under the battery mode, buzzer icon will blink; it will disappear under other cases.

iv. Fault icon will be on when UPS on fault mode, otherwise it will not.

※ Digital display area:

i. Under none setting mode, it will display UPS output information when UPS normally runs in AC mode; other information like input, battery, load and temperature will be showed after pressing the inquiring key; Instead of this, fault code will be told in fault mode.

ii. Under setting mode, user could adjust different output voltage as well as activate ECO and bypass mode by operating function setting key and inquiring keys.

※ Mode display area:

i. This area will display the power capacity of the machine after start the UPS within 20 seconds.

ii. After over 20 seconds, this area will display the work mode of the machine. e.g. stdby(standby mode),bypass(bypass mode),line(AC mode),bat(battery mode),batt(battery selftest mode), ECO(economic mode),shutdn(shutdown mode).

3.4 Turn On/Off operation

3.4.1 Turn On operation

i. Turn on the UPS on Line mode

① Once mains power is plugged in, the UPS will charge the battery, at the moment, LCD shows that the output voltage is 0, which means UPS has no output as default condition. If it is expected to have output of bypass, you can set the bps "ON" by LCD setting menu.

② Press and hold the ON key for more than half a second to start the UPS, then it will start the inverter.

③ Once started, the UPS will perform a self-test function, LED will light and go out circularly and orderly. When self-test finishes, it will come to line mode, the corresponding LED lights, UPS is working on line mode.

ii. Turn on the UPS by DC without mains power

① When mains power is disconnected, press and hold the ON key for more than half a second to start UPS.

② The operation of UPS in the process of start is almost the same as that when mains power is in. After finishing the self-test, the corresponding LED lights and UPS is working on battery mode.

3.4.2 Turn Off operation

i. Turn off the UPS on line mode

① Press and hold the OFF key for more than half a second to turn off the UPS and inverter.

② After UPS shutting down, LED go out and there is no output. If output is needed, you can set bps "ON" on LCD setting menu.

ii. Turn off the UPS by DC without mains power

① Press and hold the OFF key for more than half a second to turn off the UPS.

② When turning off the UPS, it will do self-testing firstly. LED light and go out circularly and orderly until there is no display on the panel.

3.5 UPS self-test/mute test operation

i. When UPS is on line mode, press and hold the self-test/mute key for more than 1 second, LED light and go out circularly and orderly. UPS comes to self-test mode and tests its status. It will exit automatically after finishing testing, LED resume.

ii. When UPS is on battery mode, press and hold the self-test/mute key for more than 1 second, the buzzer stops beeping. If you press and hold the self-test/mute key for one more second, it will restart to beep again.

3.6 Panel function setting

UPS has setting function. It can run the setting on any mode. After setting, it will become effective at once when meets some standards. The set information can be saved only when the battery connected and normally turning off the UPS.

The operation of setting is as following:

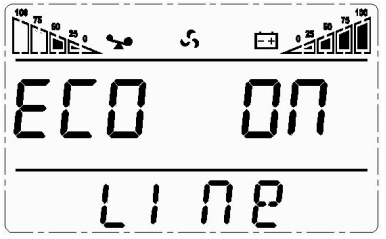
3.6.1 ECO mode setting

① Enter the setting interface. Press and hold the function setting key ⏎ for more than 2 seconds, then come to setting interface, the letters "ECO" will flash;

② Enter the ECO setting interface. Press and hold the function setting key ⏎ for more than half a second(less than 2 seconds), then come to setting interface of ECO, at this time, the letters "ECO" will light for a long time. The "ON" (or OFF) will flash. Press and hold the inquiring key (◄ , ►) for more than half a second (less than 2 seconds) to determine whether the ECO function is used or not. If used, the corresponding word is "ON", if not, the word is "OFF". It can be determined by yourself.

③ Confirm the ECO selecting interface. After selecting ON or OFF, press and hold the function setting key ⏎ for more than half a second (less than 2 seconds). Now, the ECO setting function is completed and the "ON" or "OFF" will light without flash.

④ Exit from the setting interface. Press and hold function setting key ⏎ for more than 2 seconds, exit from the setting interface and turn to main interface.



3.6.2 Bypass mode setting

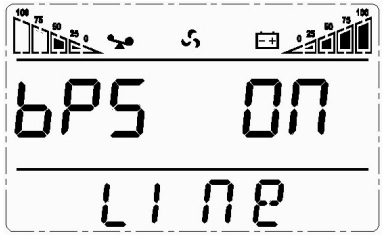
① Enter the setting interface. Press and hold the function setting key ⏎ for more than 2 seconds, then come to setting interface, Press and hold the function setting key ⏎ for more than half a second(less than 2 seconds), select the function setting, choose the bypass output interface, at the moment, the letters "bPS" will flash.

② Enter the Bypass output selecting interface. Press and hold the function setting key ⏎ for more than half a second(less than 2 seconds), then come to setting interface of bPS, at this time, the letters "bPS" will light for a long time. The "ON" letter will flash. Press and hold the inquiring key（◄ , ► ）for more than half a second (less than 2 seconds) to determine whether the bPS function is used or not. If used, the corresponding word is "ON", if not, the word is "OFF". It can be determined by yourself.

③ Confirm the Bypass output selecting interface. After selecting ON or OFF, press and hold the function setting key ⏎ for more than half a second (less than 2 seconds), Now, the bPS setting function is completed and the "ON" or "OFF" will light without flash.

④ Press and hold function setting key ⏎ for more than 2 seconds, exit from the setting interface and return to main interface.

⑤ After setting bPS as ON, when mains power plugged in without turning on the UPS or no mains power plugged in, there is bypass output but no power down backup function.



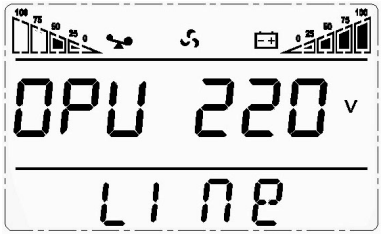
3.6.3 Output voltage setting

① Enter the setting interface. Press and hold the function setting key ⏎ for more than 2 seconds, then come to setting interface, Press and hold the inquiring key（◄ , ► ）for more than half a second(less than 2 seconds), select the function setting, choose output voltage setting interface, at the moment, the letters "OPU" will flash.

② Enter the output voltage selecting interface. Press and hold the function setting key ⏎ for more than half a second(less than 2 seconds), then come to setting interface of output voltage OPU, at this time, the letters "OPU" will light for a long time. The numerical value below the OPU will flash. Press and hold the inquiring key（◄ , ► ） for more than half a second (less than 2 seconds), select the numerical value in accordance with "OPU" function. The provided voltages are 208v, 210v, 220v, 230v, 240v, you can choose anyone by yourself (The default is 220v).

③ Confirm the output voltage selecting interface. After selecting numerical value, press and hold the function setting ⏎ , for more than half a second (less than 2 seconds). Now, the OPU setting function is completed and the numerical value will light without flash.

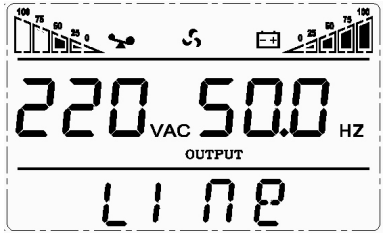
④ Exit from the setting interface. Press and hold function setting key ⏎ for more than half a second (less than 2 seconds), exit from the setting interface and return to main interface.



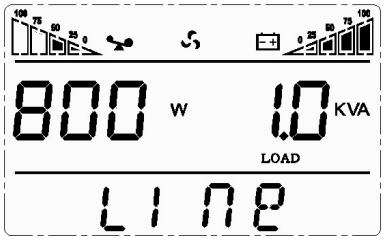
3.7 Parameters inquiring operation

Press and hold the inquiring key ◄ or ► for more than half a second(less than 2 seconds) to inquire about items. The inquired items include input, battery, output, load, temperature. The displayed items on LCD screen are showed as following:

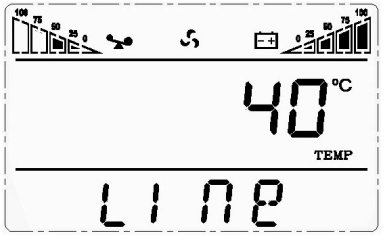
Output: Display the output voltage and output frequency of the UPS. As the following graphic shows, the output voltage is 220v, the output frequency is 50Hz.



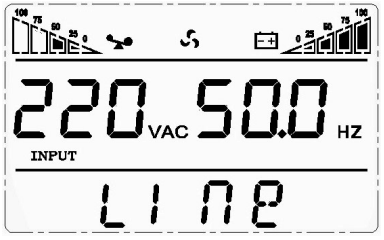
Load: Display the numerical value of the active power(WATT) and apparent power(VA) of the load. For example, as the following graphics shows: the WATT of the load is 800w, VA is 1000VA (when disconnect load, it is a normal phenomenon to show a small numerical value of WATT and VA).



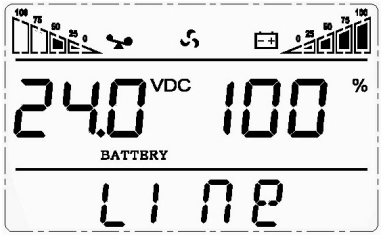
Temperature: Display the maximum temperature of the components in the UPS. As the following graphics shows: the maximum temperature is 40℃.



Input: Display the voltage and frequency of the input. As the following graphics shows: the input voltage is 220v, input frequency is 50Hz.



Battery: Display the voltage and capacity of the battery (determined by type). As the following graphics shows: the battery voltage is 24v, the capacity of battery is 100％(the capacity of battery is approximately reckoned according to the battery voltage).



Press and hold the inquiring key ◄ for more than 2 seconds, LCD begins to display the items circularly and orderly which transfer to another every 2 seconds. Press and hold the key for some time again within 30s, it will return to output status.

4. Working mode introduction

4.1 Bypass mode

LED indications on front panel on bypass mode are as following:

Bypass yellow LED is on, the buzzer beeps once every 2 minutes . The warning red LED is on when beeping, LCD displays are according to the exact load and battery capacity.

Turn to bypass mode under the following two conditions:

① Turn off the UPS on line mode while start the bypass output.

② Overload on line mode.

NOTE: When UPS is working on bypass mode, it has no back up function.

4.2 Line mode

LED indications on front panel on line mode are as following: The inverter green LED is on.

When input AC mains is in line with the working conditions, UPS will work on line mode.

4.3 Battery mode

LED indications on front panel on battery mode are as following: both the inverter green LED and battery yellow LED are on, the buzzer beeps once every 4 seconds. The warning red LED is on when beeping.

When the mains power down or instable, UPS will turn to battery mode at once.

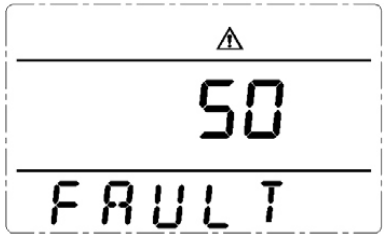
4.4 ECO mode

LED indications on front panel on ECO mode are as following: both the inverter green LED and bypass yellow LED are on.

When the input mains meets the input range of the ECO mode and start the ECO function, the UPS will works on ECO mode. If input AC mains exceed the range of ECO several times in a row in a minute but stays in inverter input range, UPS will work on AC inverting mode automatically.

4.5 Fault mode

LED indications on front panel on Fault mode are as following: warning red LED is on and LCD display fault code and related icon.



Fault mode (LCD interface on which the fault code display)

When UPS has fault. The warning LED is on and the buzzer beeps. UPS will turn to fault mode. UPS cuts off the output and LCD display fault codes. At the moment, you can press the mute key to make the buzzer stop beeping temporarily to wait for maintenance. You can also press the OFF key to shut down the UPS when confirm that there is no serious fault.

5. The warning list of the LED light and display panel

Appendix 1: The table of the fault code

Fault reason	Fault code
BUS voltage fault	00-14
Power soft start fault	15-24
Inverter voltage fault	25-39
Overheat	40-44
Output short circuit	45-49
Overload	50-54
Input NTC fault	55-59
Power fault	60-64
Input FUSE fault	65-69
Other	88

Appendix 2: Table for working status

S/N	Working status	LED on Front panel				Alarm beep
		Normal	Battery	Bypass	Fault	
1	Inverter mode (mains power)					
	Mains power voltage	●				N
	Mains power high/low voltage protection, switch to battery mode	●	●		★	One beep /4 sec
2	Battery mode					
	Battery voltage - normal	●	●		★	One beep /4 sec
	Warning for abnormal voltage of battery	●	★		★	One beep /sec
3	Bypass mode					
	Mains power normal （under Bypass）			●	★	One beep /2 mins
	Mains power high voltage warning (under Bypass)				★	One beep /4 sec
	Mains power low voltage warning (under Bypass)				★	One beep /4 sec
4	Warning for battery disconnected					
	Bypass mode			●	★	One beep /4 sec
	Inverter mode	●			★	One beep /4 sec
	Power on / Switch on					6 beeps
5	Output overload protection					
	Warning for mains power overload	●			★	2 beeps /sec
	Protect operation for mains power mode overload			●	●	Long beep

	Warning for battery overload	●	●		★	2 beeps /sec
	Protect operation for battery mode overload	●	●		●	Long beep
6	Warning for bypass mode overload			●	★	One beep /2 sec
7	Fans fault(fan icon)	▲	▲	▲	★	One beep /2 sec
8	Faults mode				●	Long beep

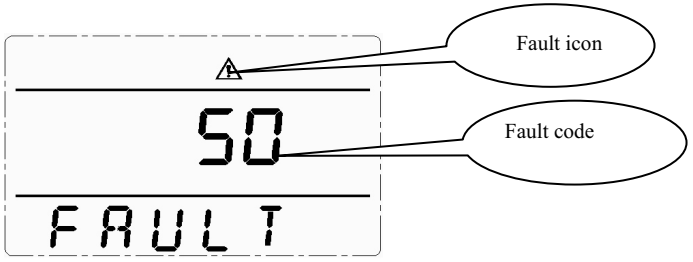
●LED Indicator lights long time
★LED Indicator flicker
▲LED indicator status depends on other conditions

Note: End user need to provide below information when require to maintain the UPS.

- UPS Model No. & Serial No.
- Date of fault occurrence.
- Fault detail (LED status, noise, AC power situation, load capacity, for long back up type, battery capacity configuration is also necessary.)

6. Trouble shooting

When the system runs in failure mode, the LCD will show as below:



Explicit Troubleshoot Introduction Sheet

Trouble indication	Failure point	Solution
Fault LED on, audible buzzer Persistently alarm, the fault code is 00-14	Bus bar voltage fault	Please test the bus bar voltage or contact the supplier.
Fault LED on, audible buzzer persistently alarm, the fault code is15-24	Soft start fault	Please check the soft start up circuit, especially the soft start resistance or contact the supplier directly.
Fault LED on, audible buzzer persistently alarm, the fault code is 25-39	Inverter voltage fault	Please contact the supplier.
Fault LED on, audible buzzer persistently alarm, the fault code is 40-44	Over temperature inside	Please make sure the UPS didn't get overload, and the fan vent was not obstructed, as well as the indoor temperature is not high. Leave alone the UPS 10 minutes for cooling, and restart it. If failure remains, please contact the supplier.
Fault LED on, audible buzzer Persistently alarm, the fault code is 45-49	Output short-circuit	Turn of the UPS and disconnect all the load, make sure there no any fault or internal short circuit of the load. And then restart the UPS, if failure still, please contact the supplier.
Fault LED on, audible buzzer persistently alarm, the fault code is 50-54	Overload	Please check the load level and disconnect the noncritical devices, recount the total capacity of your load and reduce the load to the UPS. Please check whether the load device has fault or not?
Fault LED on, audible buzzer persistently alarm, the fault code is 55-59	Input NTC fault	Please contact the supplier.
Fault LED on, audible buzzer persistently alarm, the fault code is 60-64	Power fault	Please Check whether the input & output power normal or not, contact the supplier if it is abnormal.
Fault LED on, audible buzzer persistently alarm, the fault code is 65-69	Input fuse fault	Please check if the input fuse is burnt. Replace the old fuse and restart the UPS. If failure remains, please contact the supplier.
Fault LED on, audible buzzer persistently alarm, fan icon in the LCD flickers	Fan fault	Please check whether the fan connect well, is the fan plugged and is the fan broken? If all above condition is ok, please contact the supplier.

UPS fail to start when operate "On" key.	Pressing time too short	Please press the power key more than 2 seconds to start the UPS.
	The input connection is not ready or UPS internal battery disconnect	Please connect the input well, if the battery voltage is too low, please disconnect the input and start the UPS with no-load.
	UPS internal system fault	please contact the supplier.
Back up time become short	Battery undercharge	Please keep the UPS battery recharging more than 3 hours
	UPS overload	Please check the load level and disconnect the noncritical devices,
	Battery maturing, capacity descend.	Please change new battery, contact your supplier to get the new battery and spare parts.
UPS doesn't have any power go through even main power on.	UPS input breaker disconnects.	Please reset the circuit breaker by manual.

7. Attention of battery disposal

◇Please take off your ring, watch and other metals before operate the batteries.
◇If you want to change the battery cable, please purchase the material from our local service center or distributors, to avoid heating or spark due to the inadequate power capacity, and even causing fire.
◇Dont dispose of the battery or battery pack near or into fire, otherwise it will explode and injure person.
◇Don't damage or open the battery case, the battery electrolyte overflow is with highly toxic which is harmful to human.
◇Please avoid short circuit between positive and negative terminal, otherwise may cause fire or electric shock.
◇Please check the battery voltage before touching. If the loop of battery and loop of input voltage is non-isolated, that will cause high voltage risk between battery terminals and ground.

8. Network communication

This series UPS offer intelligent network interface with a dedicated Ethernet card (optional accessory), realizing network communication and management. For more information about this function, please turn to our local distributor or service center.

9. Communication interface introduction

The UPS can communicate with PC via analog relay joint and serial interface (RS232). The former makes use of the transistor's "ON" and "OFF" action to transmit the input power condition and UPS status to PC. The latter can offer serial communication interface with PC to monitor input power and UPS status information, and even control the UPS.

Note: The communication function is only realizable with the specific communion cable from the supplier.
Rs232 interface is set as below:
◇Bit rate: 2400bps
◇Byte: 8bit
◇Completion code: 1bit
◇Bit Pattern: None

Appendix 1: EMC Level

The series product is designed to meet the below standard.

EMS	
IEC61000-4-2(ESD)	**Level 4**
IEC61000-4-3(RS)	**Level 3**
IEC61000-4-4(EFT)	**Level 4**
IEC61000-4-5(Suege)	**Level 4**
EMI	
GB9254-1998/IEC 62040-2	**Class B**

Appendix 2: Symbol instructions:

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Symbols and significations			
Symbol	Significations	Symbol	Significations
⚠	Caution	⏚	Protect grounding
⚠	Danger! High Voltage!		Alarm cancel
ON	Turn on		Overload
OFF	Turn off	⊣⊢	Battery inspection
⏻	Standby or Shutdown	♻	Repeat
~	AC		Display screen repeat key
⎓	DC		Battery

Appendix 3: Specification Sheet

Rated Capacity		1KVA	2KVA	3KVA	6KVA	10KVA
Input						
Rated input voltage		220V				
Rated input frequency		50Hz/60Hz auto-adaptive				
Input voltage range		110～290±5VAC (half load) 140～290±5VAC (full load)				
Input frequency range		45-55Hz+/-0.5% 50Hz ； 55-65Hz+/-0.5% 60Hz				
Phase		Single Phase + N + GND				
PFC		≥0.98			≥0.99	
Input standard current (Linear full load)		4.0A	8.1A	12.1A	24.2A	40.4A
Input protection						
Rated current protection		8A over current breaker	15A over current breaker	20A over current breaker	50A air breaker	80A air breaker
THDI		< 6%			< 5%	
Bypass voltage range		Rated output voltage -34V ～ Rated output voltage +32V				
Bypass Low/High restoring point		Bypass Low +10V			Bypass High-10V	
Output						
Output voltage		208VAC /210VAC/220VAC/230VAC/240VAC Setting available				
Output PF.		0.8				
Output power(VA/Watt)		1000/800	2000/1600	3000/2400	6000/4800	10000/8000
Voltage accuracy		±1%				
Output balance voltage		≤200mv				
Load crest		3:1				
Bypass output before ON		Default is No; Setting available				
Output frequency						
Under Mains mode		Same as input frequency				
Under battery mode		（50/60±0.2）Hz				
Phase-locked rate		≤1Hz/s				
Total voltage harmonic distortion		Full linear load< 3%；Full nonlinear load< 5%				
Transfer time						
From Mains mode to battery mode		0ms				
From battery mode to Mains mode		0ms				
From Mains mode to bypass mode		<4ms			0ms	
From bypass mode to Mains mode		<4ms			0ms	
From normal mode to ECO mode		≤10ms				
System efficiency	Mains mode at full load	≧90 %			≧92%	
	Battery mode	87%			90%	
	ECO mode	94%				
Inverter overload capability		105%～150%: transfer to bypass mode after 30s giving alarm; ＞150% : transfer to bypass mode after 300ms giving alarm;			105%～125%: transfer to bypass mode after 10 mins giving alarm; 125 ~150% : transfer to bypass mode after 30 giving alarm; ＞150% : transfer to bypass mode after 100ms giving alarm;	

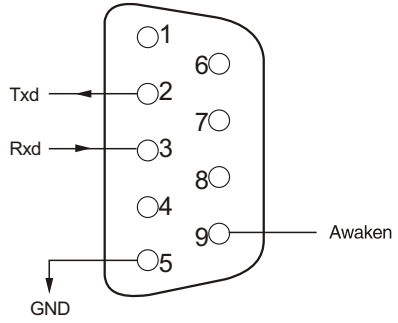
Auto-recovery		yes				
Battery						
Battery type		Sealed lead acid maintenance free battery				
DC voltage		24V DC	48V DC	72V DC	168V DC	168V DC
Inbuilt battery		9AH/12V	9AH/12V	9AH/12V	9AH/12V	9AH/12V
Quantity		2	4	6	14	14
Back up time		≥5 minutes with half load	Based on battery capacity		Non-linear full load	
Charger						
Output voltage		27.5±0.4V	55±0.6V	82.5±0.9V	193.7±0.9V	193.7±0.9V
Charge method		Three-stage charging				
Recharge time		90% capacity after 5hrs charging (standard model)				
		According to battery capacity(long time model)				
Input voltage range		80VAC~300VAC				
Charge current		Standard model:1A				
		Long time model: 6A (can extend to 12A)				
System Control						
Function		Silence; cold start; AC restart; Auto restart.				
Protection		Over-temp protection Fan testing protection AC L and N reversely connecting protection Output short circuit protection				
Communication						
Communication port		RS232, SNMP card , USB				
Software function		Graphics analyze; Switch on/off UPS system, Monitor UPS working status, history record and event log				
Display		LCD/LED				
System Operating Environment						
Operating environment	Operation tem.	0 ～ 40 ℃				
	Store tem.	-25℃ ～ 55 ℃				
	Humidity	20 ～ 90%（non-condensing）				
	Altitude	0m＜altitude ＜1500m, over 1500m, used with power derated				
Noise		＜50db (1-3kva)				
		＜55db(6-10kva)				
Type		Tower 1KVA	Tower 2KVA	Tower 3KVA	Tower 6KVA	Tower 10KVA
Dimension（W*D*H）		144*357*215	190*439*341		262*514*455 (H)	
					262*510*735 (S)	
Weight（Kg）	Long backup model (H)	6	12	12.5	42	
	Standard model (R)	10	20	24	75	
Type		Rack mount 1KVA H	Rack mount 1KVA S	Rack mount 2KVARH	Rack mount 3KVARH	Rack mount 2KVARS	Rack mount 3KVARS
Dimension（W*D*H）		483*442*88		483*492*88		483*600*88	
Dimension（W*D*H）with handle		483*480*88		483*530*88		483*640*88	
Weight（Kg）		9.5	13.8	12.5	13.5	21	30.5

Appendix 4: Communication port

● Communication port for PC

At the rear panel of this model, there is one DB9 port, which provides several signals as follows:

Foot	Explanation	Foot	Explanation
1	empty	6	empty
2	Send	7	empty
3	receive	8	empty
4	empty	9	awaken
5	GND		



Communication port for PC

●TCP/IP

This model UPS can supply one Intelligent Slot at the rear panel, which was compatible with most of the software and hardware all of the world, such as running HP open view，IBM net view，SUN net manager and other operation system. UPS is with function login on internet supplying information of UPS status and input power, and even capable of controlling UPS via net management system.

For more information, please turn to local supplier or distributor.